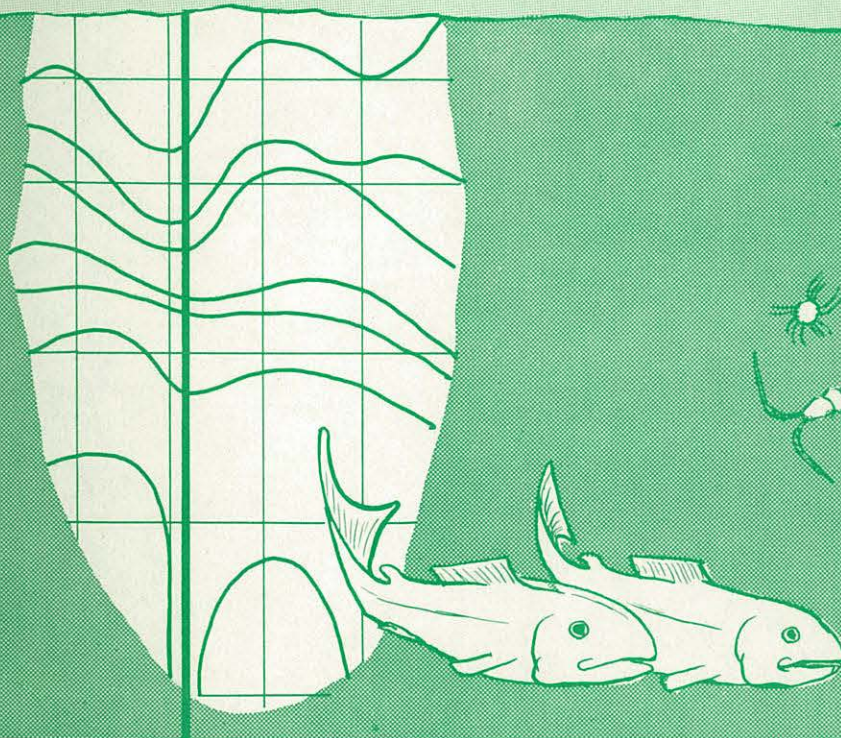
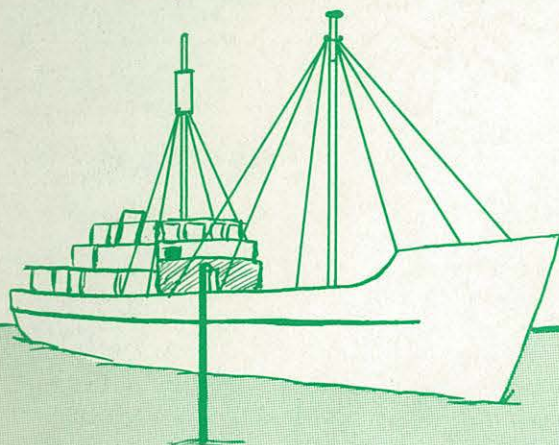


MARINE RESEARCH

BUREAU OF COMMERCIAL FISHERIES

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CRUISE REPORT

RV George B. Kelez

Cruise 64-6, 5-19 November, 1964

BIOLOGICAL LABORATORY SEATTLE, WASHINGTON

CRUISE REPORT

RV George B. Kelez

Cruise 64-6, 5-19 November, 1964

This was the fifth oceanographic cruise in a continuing study of seasonal and longer term changes of certain biological, chemical, and physical properties of the marine environment off the coasts of Washington and British Columbia. It was conducted by the Oceanographic Section of the Bureau of Commercial Fisheries, Seattle Biological Laboratory.

Physical Oceanography

Twenty-one oceanographic stations and 35 BT's were taken along the same two lines, (1) Willapa Bay to Cobb Seamount and (2) Cobb Seamount to Esteban Point on Vancouver Island (fig. 1), which were initially traversed during the Kelez cruise No. 64-2a in April, 1964. Along each line, stations were located at the 30-, 65-, 100-, 500-, and 1,000-fathom depth contours over the continental terrace and at 25 and 50 mile intervals from the terrace to Cobb Seamount.

At each station 12 drift bottles were released, the BT was lowered to a maximum depth of 260 meters or to within 10 meters of the bottom in shallow water (< 150 fathoms), surface temperature and salinity were obtained from a bucket sample, and two Nansen bottle casts were made. The sampling depths were normally at 10; 25; 50; 75; 100; 125; 150; 200; 250; 300; 400; 500; 600; 700; 800; 1,000; 1,200; 1,500; 1,800; 2,000; and 2,500 meters, and as near the bottom as feasible. Each bottle held two protected reversing thermometers, and bottles below 200 meters had an additional unprotected thermometer. Water samples for analysis of salinity and dissolved oxygen

were drawn from all Nansen bottles. Salinities were stored aboard ship for analyses ashore while all dissolved oxygen analyses were completed on board the ship using a modified Winkler technique and a Metrohn Piston Buret.

Two methods were used to obtain values of temperature, salinity, and dissolved oxygen near the bottom. In water at and less than 1,000 fathoms deep, a weight-release device (tripper) designed to trip a Nansen bottle 5 meters from the bottom was used. An abyssal pinger (Hydroproducts-Model 1045 C) was attached above the tripper and its distance from the bottom was determined from the Edo depth recorder unit. Although malfunction in the pinger prevented obtaining tripper samples over the continental terrace at 600-, 700-, 800-, 900-, and 1,000-fathom contour stations on lines No. 1 and 2, the tripper was operated successfully in the vicinity of the 30-, 65-, 100-, 125-, 150-, 200-, 300-, 365-, 400, and 500-fathom depth contours on both lines. In water deeper than 500 fathoms, the bottom Nansen bottle was lowered and tripped within 20 to 30 meters of the bottom depth indicated by the Edo.

Chemistry and Phytoplankton

Samples were taken at the mouth of the Strait of Juan de Fuca; just seaward of the entrances to Grays Harbor, Willapa Bay, the Columbia River, and Quatsino Sound; 10 miles east of Cobb Seamount; and in Queen Charlotte Sound (on Cook Bank and at the mouth of Queen Charlotte Strait) (fig. 1). Water samples for both the chemical and phytoplankton studies were taken with Van Dorn samplers. Bathythermograph observations were made at each station.

Chemistry.--Water samples were taken at depths of 1 and 40 meters at all stations except the Strait of Juan de Fuca and Cobb Seamount where the sampling depths were 1 and 100 meters. The water samples were filtered through membrane filters of 0.45-micron pore size. Filters and filtrates were stored for analyses of chemical nutrients and trace metals ashore.

Phytoplankton.--Water samples were taken at depths of 1, 5, 10, 15, 25, and 40 meters at all stations except the Strait of Juan de Fuca and Cobb Seamount where the sampling depths were 1, 5, 10, 15, 20, 25, 35, 50, 75, and 100 meters. Subsamples for pigment analysis were filtered through membrane filters of 45-micron pore size under 4 to 8 pounds of air pressure. The filters were frozen in desiccators. Subsamples of unfiltered water were taken for salinity analysis; others were preserved in dilute formalin and stored for analysis of phytoplankton species.

Plankton.--At each of these stations, oblique tows with plankton nets were made at night in the upper 30 meters. Successive 15-minute tows were made with 1-meter, #0 mesh; 1/2-meter, #6 mesh; and 1/4-meter, #20 mesh nets. The catches were separated to size by straining through #0 mesh, #6 mesh, and #20 mesh strainers. Subsamples from each size group were stored frozen in plastic vials for chemical analyses. Another portion from each group was preserved in dilute formalin for identification of organisms ashore.

Macrozooplankton.--Oblique tows of 30 minutes duration from 30 meters to the surface were made at night at 18 stations along the cruise track using a modified Isaacs-Kidd midwater trawl with a 3-foot opening (fig. 1). The samples were preserved in formalin and returned to shore for analysis of abundance, distribution, and composition of the macroplankton.

General Operations

The Kelez departed from Seattle at 1230 hours on 15 November, 1964. Sampling proceeded normally until the 500-fathom station on line #1 was reached, where the abyssal pinger malfunctioned. Samples from near the bottom at closely spaced stations over the continental slope were successfully obtained at and in water depths of less than 500 fathoms on both lines, but were not obtained in deeper water, thus eliminating five tripper stations on each line. Winds of 50 to 75 knot intensity made it impossible to work on the 11th and 12th. Good weather for the remainder of the trip greatly enhanced working capabilities. All other sampling was successfully completed.

The Kelez returned to Pier 90, Seattle at 1030, November 19.

Personnel (Cruise 64-6)Scientific Party

D. Day, Oceanographer, Party Chief

J. Finley, Fishery Technician

D. Fisk, Fishery Aid

Ship's Complement

Harry Jacobsen, Captain

Palmer Ness, 1st Mate

Harold Finlayson, Chief Engineer

George Wagner, 2nd Engineer

Harry Elsin, 3rd Engineer

Leonard Atkinson, Electrician

Tom Dunatov, Fisherman

Harold Carlsen, Fisherman

Alfonso Langstrand, Fisherman

Marin Andreassen, Fisherman

Reidar Hornli, Cook

Olaf Beaverford, Messman

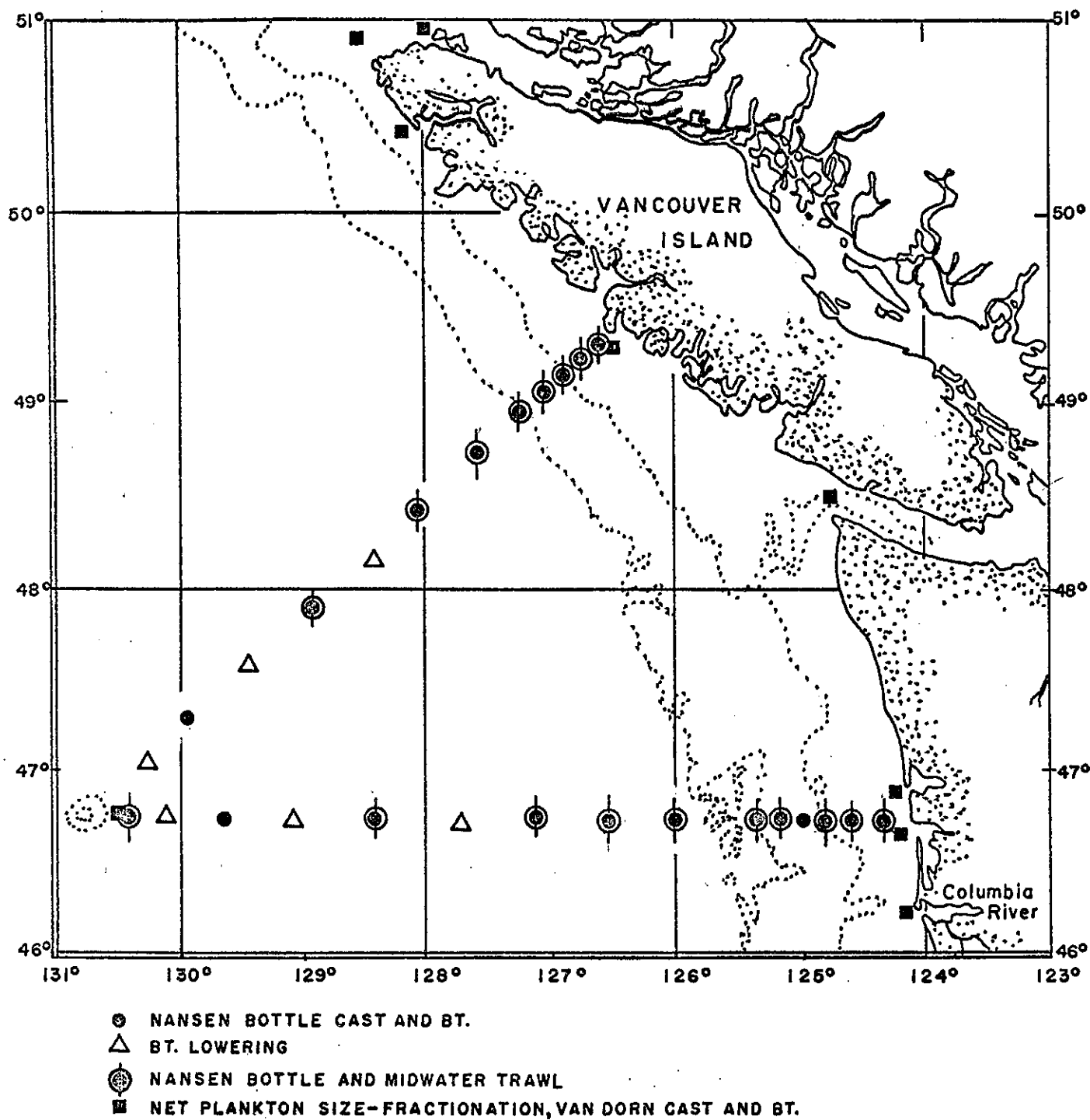


Figure 1.--Location of stations, Cruise 64-6. (The 100- and 1000-fathom depth contours are shown.)

NOVEMBER 1964 CRUISE - KELEZ

Phosphate Determinations

8820Å
10 Cm Cell
F = 5.50 $\mu\text{g}\text{atPO}_3/\text{l}$

Standards Absorbance

Blank 1 .004 F = $\frac{3.00}{.550-.005}$

Blank 2 .005
1 .550 F = 5.50 $\mu\text{g}\text{atPO}_3/\text{l}$
2 .551
3 .550
4 .550
 $\Sigma = .550$

Hitachi-Perkin-Elmer
#139 Spectrophotometer

Silicate Determinations

8100Å
1 Cm Cell
F = 95.6 $\mu\text{g}\text{atSiO}_3/\text{l}$

Standards Absorbance

Blank 1 .013 F = $\frac{50}{.536-.013}$

1 .538
2 .523 F = 95.6 $\mu\text{g}\text{atSiO}_3/\text{l}$
3 .541
4 .541
5 .539
 $\Sigma = .536$

Samples

Station-Depth	Absorbance	$\mu\text{g}\text{atPO}_3/\text{liter}$
1-1	.173	.95
1-75	.178	.98
2-1	.206	1.13
2-30	.176	.97
3-1	.136	.75
3-40	.222	1.22
4-1	.132	.73
4-40	.128	.70
24-1	.126	.69
24-100	.126	.69
41-1	.223	1.23
41-40	.409	2.25
42-1	.262	1.44
42-40	.276	1.52
43-1	.265	1.46
43-35	.260	1.43
44-1	.281	1.55
44-40	.322	1.77

Station-Depth	Absorbance	$\mu\text{g}\text{atSiO}_3/\text{l}$
1-1	.195	18.64
1-75	.202	19.31
2-1	.204	19.50
2-30	.134	12.81
3-1	.231	22.08
3-40	.165	15.77
4-1	.173	16.54
4-40	.097	9.27
24-1	.046	4.40
24-100	.044	4.21
41-1	.262	25.05
41-40	.516	49.33
42-1	.281	26.86
42-40	.305	29.16
43-1	.284	27.15
43-35	.276	26.38
44-1	.329	31.45
44-40	.374	35.75